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## WORKSHOP INFORMATION SHEET 2

### List of Minerals Recorded at Ecton

Extracted from **The Minerals of the Peak District of Derbyshire**  
By Ford, T.D., Sarjeant, W.A.S. & Smith, M.E. (1993 Reprint) *UK Journal of Mines & Minerals* No. 13: *Bull. P.D.M.H.S.* Vol. 12.1 (Joint publication)

#### Specific Mentions of Ecton:

##### ELEMENTS:

Native copper recorded in small quantities

##### SULPHIDES:

Galena PbS: throughout Peak District,

Sphalerite ZnS: lower levels of Ecton mines,

Pyrite & Marcasite FeS<sub>2</sub>: minute pyrite cubes encrust celestine crystals adjacent to millerite in Clayton Mine, Ecton.

Chalcopyrite CuFeS<sub>2</sub> : massive ore and crystals often encrust calcite scalenohedra (spectacular old specimens from Ecton); principal copper ore at Ecton.

Chalcocite Cu<sub>2</sub>S small quantities

Covellite CuS small quantities, fairly common in smithsonite as an alteration product of copper-bearing inclusions in sphalerite

Bornite Cu<sub>5</sub>FeS<sub>4</sub> : second most important copper ore at Ecton

Millerite NiS : occurs either encrusting or as inclusions with celestine in Clayton Mine, Ecton

Arsenopyrite FeAsS

##### OXIDES:

Cuprite Cu<sub>2</sub>O exists from secondary oxidation of cupriferous ores, known as brown oxide of copper.

Tenorite CuO, black powdery oxide

##### HYDROXIDES:

Goethite Fe(OH)<sub>2</sub> or limonite

##### HALIDES:

Fluorite CaF<sub>2</sub> : blue colour at Ecton with chalcopyrite inclusions common. Also colourless crystals with dark blue edges to crystals

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**CARBONATES:**

Calcite  $\text{CaCO}_3$ , scalenohedra studded with small chalcopyrite crystals. Cave pearls at East Ecton, also speleothems (flowstones etc): green ones contain copper carbonates.

Cerussite  $\text{PbCO}_3$

Siderite  $\text{FeCO}_3$

Smithsonite  $\text{ZnCO}_3$  (formerly called Calamine)

Hydrozincite  $\text{Zn}_5(\text{CO}_3)_2(\text{OH})_4 \cdot 2\text{H}_2\text{O}$

Strontianite  $\text{SrCO}_3$ , only seen in 1860, may be celestite

Malachite  $\text{Cu}_2\text{CO}_3(\text{OH})_2$  bright green, blobs and crusts on tips, in pipes

Azurite  $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$  blue, with malachite

Aurichalcite  $(\text{Zn,Cu})_5(\text{CO}_3)_2(\text{OH})_6$  result from weathering of mixed copper and zinc ores. Feathery, pale blue-green crusts of aurichalcite at Clayton Mine

Rosasite  $(\text{Cu,Zn})_2\text{CO}_3(\text{OH})_2$  less common than aurichalcite, bluish green to dark green botryoidal or globular masses.

Zaratite  $\text{NiCO}_3(\text{OH})_4 \cdot 4\text{H}_2\text{O}$

**SULPHATES:**

Baryte  $\text{BaSO}_4$  cockscomb habit at Waterbank, flowstone in mines,

Gypsum  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$

Celestine  $\text{SrSO}_4$  rarely, but found at Waterbank, Ecton as small pale blue tabular crystals.

Morenosite  $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$  green encrustation due to weathering found on millerite filaments at Waterbank mine

Linarite  $\text{PbCuSO}_4(\text{OH})_2$  very rare small blue crystals in Clayton mine

Serpierite  $\text{Ca}(\text{Cu,Zn})_4(\text{SO}_4)_2(\text{OH})_6 \cdot 3\text{H}_2\text{O}$  very rare, delicate blue blades, Clayton and other places at Ecton

Chalcanthite  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  bright blue copper sulphate, so soluble thus rarely found in Peak District. Found in enclosed vughs in weathering zone at Ecton.

**PHOSPHATES:**

Pyromorphite  $\text{Pb}_5(\text{PO}_4)_3\text{Cl}$ , stubby prismatic crystals of bright light green. May be primary but often appears to result from weathering of galena in presence of phosphorus, or arsenic giving brown forms. Not listed as being found at Ecton but quite common in Peak District and does occur!

**SILICATES:**

Clay minerals: illite found in vein at Top of Ecton, probably with clayboards.

Secondary silicates: Chrysocolla  $\text{CuSiO}_3 \cdot 2\text{H}_2\text{O}$  small green stains in Ecton mines

Hemimorphite  $\text{Zn}_4\text{Si}_2\text{O}_7(\text{OH})_2 \cdot \text{H}_2\text{O}$  usually brownish crusts of weathered sphalerite in presence of siliceous solutions but rare crusts of colourless blades at Ecton.

**ORGANIC COMPOUNDS:**

Bitumen seeps recorded at Ecton, but not listed here in article.